Headquarters U.S. Air Force

Integrity - Service - Excellence

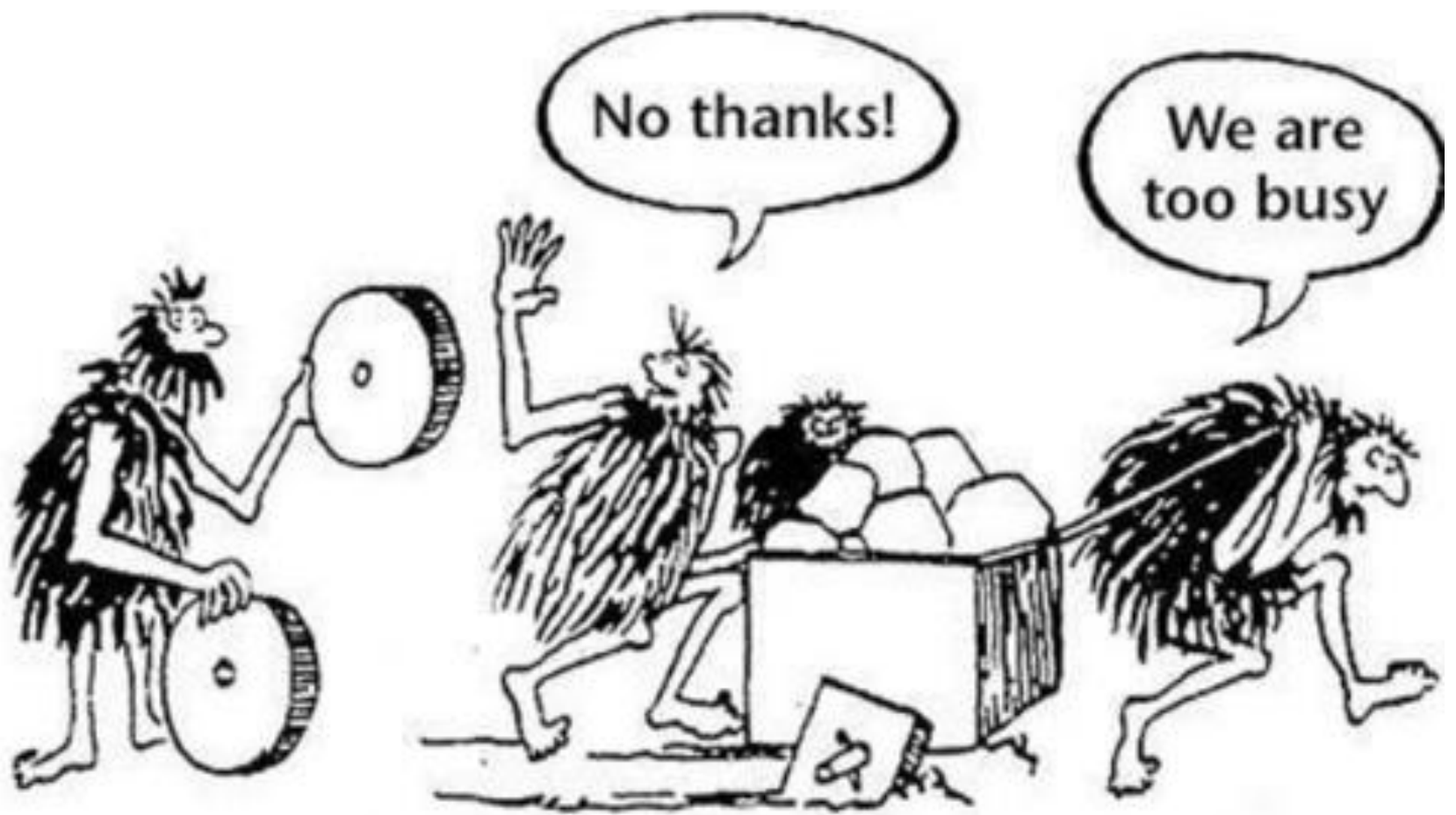## *AFCAA CEM Tabular CARD Train the Trainer*

U.S. AIR FORCE

May 2016

Outline

- **Tabular CARD Basics**

- **Table Features**

- **Describing Your Program**

- **Close**

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TABULAR CARD BASICS

CARD Background

- **A CAPE efficiency initiative is to update guidance for CARDs.**
  - **Reduce program office effort through standardized tabular reporting for commodity classes (e.g., ships, aircraft, tracked vehicles, missiles…).**
  - **Increase value to acquisition community by establishing annual updates to capture changes in program and enhance service cost agency support for service's budget development.**
  - **Tabular CARD is one of many data capture improvement initiatives**

- **Draft Implementation Schedule:**
  - **June 1, 2016 – Issue CARD Update Guidance**
  - **March 1, 2017 – Programs going to a milestone after this date must follow the updated instruction**
  - **October 1, 2017 –ACAT I programs to submit first annual CARD update using the updated instruction**
  - **Programs reaching a milestone before March 1, 2017, may submit CARDs using the new instruction in lieu of the current Interim Instruction**

- **References**
  - **DoDI 5000.73 9June2015**
  - **Dr. Morin memo 18June2015 including CARD Narrative Outline**
  - **Formal Instructions: Guidelines for the Preparation and Maintenance of the Cost Analysis Requirements Description, 22Apr2016**

CARD Background (cont'd)

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- **Commodity CARD tables will be made available in Excel workbooks on the CADE website June 1 in conjunction with issuance of CARD Update Guidance for use as a starting point**
  - **Standard commodity work breakdown structure. (Aligns with standard CSDR reporting)**
  - **Parameters and definitions. (Aligns with 1921-T technical data reporting)**
- **The tabular CARD:**
  - **Is consistent with legacy CARD use**
    - **Key technical, programmatic and operational characteristics of an acquisition program used in preparation of cost estimates**
  - **Also enables the future:**
    - **Annual CARD updates**
    - **Database and analytics vision**

CARD Workbook Overview

- **Commodity CARD tables are presently in Excel workbooks**
  - **Excel advantage: Readily usable**
  - **Excel disadvantage: Limited configuration control**
  - **Future web-based electronic CARD in CADE**

Sheet Header

Column Headers

	A	B	C	F	G
1		UNCLASSIFIED, FOR OFFICIAL USE ON			
2		CARD Tables			
3		Program CARD Table	Enter text for each parameter.		
4					
5		**Parameter Name**	**Value**	**Definition of Parameter**	**VocabularyID**
6		Program Name		Defense Cost and Resource Center (DCARC) defined Program Name	DCARCMetadata
7		Name - Short		DCARC defined, acronym	CEMVocab
8		Name - Popular		An optional alternative name	CEMVocab
9		Program Description		DCARC defined program description	CEMVocab
10		Program Number		Program Number from Defense Acquisition Management Information Retrieval (DAMIR)	DCARCMetadata
11		Mil-Handbook		Mil-STD-881 Appendix	DCARCMetadata
12		Weapon System Type		DCARC defined	DCARCMetadata
13		Lead Service		DCARC defined Service/Component	DCARCMetadata
14		Other Services		If a program is "Joint", then list other services involved in the program.	DCARCMetadata
15		Procuring Organization		SysCom	DCARCMetadata
16		Program Office		Program Executive Office (PEO) or Program Office	DCARCMetadata
17		Initial Selected Acquisition Review (SAR)		Date from Defense Acquisition Management Information Retrieval (DAMIR)	DCARCMetadata
18		Latest Selected Acquisition Review (SAR)		Date from DAMIR	DCARCMetadata
19		Upgrade/Modernization		Yes/No category	CEMVocab
20		Subprogram Name		Subprogram name if applicable	CEMVocab
21		Model		Specific configuration or designated model number	CEMVocab
22					

Program / Milestone / Acquisition / Quantities and O&S Time Phased / Roles / PMP Hardware Technical / Nonhardware Tec

Ready | | | | | | 80%

Each sheet (tab) is a table

Common Tables on red tabs
Commodity-specific Tables on green tabs

Tables in the CARD Workbook

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- **PMP Description (Supports parametric, analogy, and scaling methods)**
  - PMP Hardware Technical Table
  - Software Development Table
- **Quantity (Supports cost improvement curve methods and estimate time-phasing)**
  - Quantities and O&S Time-phased Table
  - Configuration Table
- **Manpower (Supports staff-loading methods)**
  - Manpower Time-Phased Table
- **Common Elements (Supports direct estimating of non-PMP elements)**
  - Nonhardware Technical Table
- **Detailed Information (Supports contract loading, build-up, and BOM methods)**
  - GFE Table
  - Part Level Table
  - LRU Table
- **O&S (Supports O&S methods)**
  - O&S Table
  - Manpower Time-Phased Table
  - Software Maintenance Table
  - Quantities and O&S Time-phased Table
  - PMP Hardware Technical Table

> Some tables are dual-purposed and are listed twice

- **General program description, phases, and contracting approach (Provides essential context information)**
  - Program, Milestone, Acquisition, Roles, Budget Plan, WBS/CRS Definitions Tables

Tailoring of Content & Detail by Phase & Program Uniqueness

- **Each program is different and the tables allow for (and encourage!) tailoring**
  - **The standard commodity CARD workbooks are a starting point**
  - **Add rows as needed**
- **Level of detail in the tables, depends on the maturity of the program**
  - **Programs at Milestone A or Milestone B are less well-defined than programs at Milestone C or at FRP.**
  - **In cases where there are gaps or uncertainties in the various program descriptions, these uncertainties will be acknowledged as such in the CARD. This applies to uncertainties in either general program concepts or specific program data. DISCUSS WITH SCA and CAPE ANALYST EARLY TO AVOID UNNECESSARY EFFORT.**
  - **For uncertainties in program concepts, the CARD should contain assumptions for cost-estimating purposes. DON'T LEAVE IT TO THE COST ESTIMATOR TO DEFINE YOUR PROGRAM.**

Work with your Service Cost Agency analyst and your CAPE analyst to expeditiously tailor tabular content to your program

Unknowns, Uncertainty, NAs, and TBDs

- **If a field is considered not applicable to the program, fill cell with "NA" and hide the row**
  - **Do not delete rows or columns**
- **If a single value for a parameter is unknown at this time, enter a range of values**
- **If a range of values is truly unachievable even though applicable, enter "TBD"**
  - **Use sparingly as TBD entries will receive scrutiny. CARD reviews by the SCA analyst and the CAPE analyst will assess TBDs to determine if a value is needed to conduct estimate. A range of values in lieu of a specific value, may provide more insight.**
- **Leaving cells blank gives the impression the topic has not yet been addressed and is simply incomplete.**

Work with your Service Cost Agency analyst and your CAPE analyst to expeditiously tailor the tables for your program

Markings and Security

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- **Ensure CARD Template has appropriate markings, given that it includes system requirements and technical data**
  - **FOUO**
  - **Unclassified(UC)/Classified(C) (SIPRNET)**

- **Technical Parameters**
  - **Reference program's Security Classification Guide (SCG) to identify classification of tech parameters <u>before</u> populating template**
  - **Determine how Classified parameters will be handled**
    - **Unclassified CARD: suggest " See SCG" for parameters not to be recorded in UC CARD (preclude security breach)**
  - **Identify tables with contractor design parameters, staffing levels with "Contains Contractor Proprietary Data"**

- **Adhere to your organization's policies**

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TABLE FEATURES

Parameter Name, Value, and Units

WBS/CRS Number	WBS/CRS Element	Parameter Name	Value	Unit of Measure	Estimate or Actual	Source	Notes

More columns to the right

Enter the parameter's value

Cite pedigree

Cite specific source for value (e.g. SME name and organization or a specific reference document)

Use Notes column to add any text necessary to amplify anything on this row

- **Most CARD tables are have fixed columns prepopulated with rows of parameters organized by commodity WBS**

- **Each parameter has a name, value, and units**
  - **Name and units are predefined**

- **Enter value. Note if value is estimated or actual, cite its source, and enter any necessary text to clarify or amplify the row's contents**

Pre-populated Parameter Columns

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Definition	VocabularyID	Repeatable	List Item #1	List Item #2	List Item #3	List Item #4	List Item #5	List Item #6	List Item #7	List Item #8	List Item #9	List Item #10	List Item #n

- **In addition to name and units, each parameter row has many other columns already filled**

- **Each also has a definition and vocabulary ID**
    - **Supports nascent configured vocabulary transcending CARD, 1921-T, database search, & connectivity to systems engineering databases, etc.**

- **Each parameter is further noted by its repeatability (Examples in subsequent chart)**

- **Each parameter with defined choices (Excel drop-down) has a pre-define list**

- **If you add new parameters, enter its definition and enter "New" as the Vocabulary ID**

Uncertainty

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- **Typically each parameter has a single value**
- **When showing a range is needed, expand hidden columns to do so**
  - **This is not intended to be full-blown uncertainty analysis (though you can add that info in the Notes column if desired)**
- **A given parameter's design margin may be expressed in the designated column**
  - **Use the same unit of measure – not percent margin**
  - **A row parameter named "Weight Including Margin" may be used equally well with value in the Value column (if doing so then leave Margin column blank)**

Design Specifications

		E	I	K			O

Hit the Ungroup button above to see Uncertainty and Margin

Hit the Ungroup button above to see Objective/Threshold columns.

Value	Unit of Measure	Estimate or Actual	Source	Notes

Value	Unit of Measure	Estimate or Actual	Objective	Threshold	Source	Notes

Requirements may be expressed in terms of Objective and Threshold as needed.

- **Typically used only at parent levels**

- **Each is a single value in the unit of measure noted**

Multiple Points of View
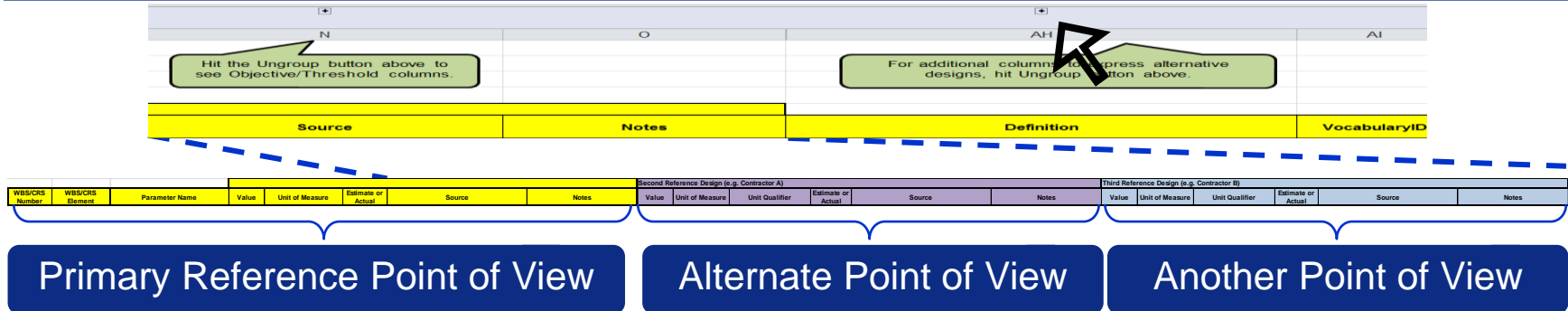
- **Multiple points of view (POV) are accommodated via extra columns when applicable**
  - **When carrying multiple contractors pre-MS A**
  - **Program of Record versus an independent review team's expected outcome**
- **Other ways to express alternate POVs in the tabular CARD**
  - **Separate tables for each POV in a single workbook**
  - **Separate workbooks for each design**
  - **Extensive use of notes column to describe the alternate point of view**
  - **When alternate POV pertains to only a few parameters: copy and insert paste the row; add parenthetical suffix to the name; and use notes as needed to further explain**
    - **e.g. "Weight" and "Weight (Red Team Forecast)"**

Repeatable Rows

- **Several rows are designated Repeatable with "1…n" or "1…n (Specify)" in their name**

- **Copy row or groups of rows and insert as many new rows as needed.**

- **Rename per individual row instructions**

Parameter Name			Repeatable
Material Mix 1…n			Y
Manufacturing Process 1…n			Y
Program Office Support 1…n (Specify)			Y
Test Agency 1…n (Specify)			Y
Other Government Agency MIPR 1…n (Specify)			Y
For each Type of Test 1…n			
Test 1			Y
Test Name			Y
Test Type			Y
Facility Location			Y
Test Description			Y

Units Qualifier

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- **Use when Name, Value, Unit of Measure is incomplete**
  - **When a parameter may be repeated and occur on many (consecutive) rows for a single WBS element, the Qualifier distinguishes each row**
  - **Every time a unit of measure is "Quantity" a Qualifier is expected. The qualifier designates each row's uniqueness**
  - **Every time a unit of measure is "List" and the Value is "Other" a Qualifier is expected. The Qualifier illuminates atypical choice selections**

Parameter Name	Value	Unit of Measure	Unit Qualifier	List Item 1	List Item 2	List Item 3
Material Mix	50	Percent Weight	Aluminum			
Material Mix	25	Percent Weight	Graphite Expoxy			
Material Mix	10	Percent Weight	Steel			
Number of Targets by Type	8	Quantity	Drones			
Number of Targets by Type	4	Quantity	Barges			
Number of Targets by Type	1	Quantity	Bunkers			
Engine Type	Other	List	Turbofan	Turbojet	Turboprop	Other

Table Tailorability

- **For most of the tables, the columns must remain fixed**
  - **Insert rows as needed**
  - **Hide rows and columns not used**
  - **Specific table "tailorability" is discussed with each table's specific instructions**

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DESCRIBING YOUR PROGRAM IN TABLES

Cost Drivers by WBS Described in Tables

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WBS Number	WBS Element
1.0	Aircraft
1.1	Air Vehicle
1.1.1	Airframe
1.1.1.1	Airframe IAT&Co
1.1.1.2	Fuselage
1.1.1.3	Wing
1.1.1.4	Empennage
1.1.1.5	Nacelle
1.1.1.6	Other Airframe Components (specify)
1.1.2	Engine/Propulsion
1.1.2.1	Propulsion IAT&Co
1.1.2.2	Propulsion Hardware
1.1.2.3	Propulsion Software Release 1..n (Specify)
1.1.2.3.1	Propulsion Software CSCI 1..n (Specify)

WBS Number	WBS Element
1.2	System Engineering
1.2.1	Software Systems Engineering
1.2.2	Integrated Logistics Support
1.2.3	Other Systems Engineering 1...n (Specify)
1.3	Program Management
1.3.1	Software Program Management
1.3.2	Integrated Logistics Support
1.3.3	Other Program Management 1...n (Specify)
1.4	System Test and Evaluation

WBS Number	WBS Element
1.0	Sustainment Effort
1.1	Unit-Level Manpower
1.1.1	Operations Manpower
1.1.2	Unit-Level Maintenance Manpower
1.1.3	Other Unit-Level Manpower
1.2	Unit Operations
1.2.1	Operating Material
1.2.1.1	Energy (Fuel, POL and Electricity)

PMP Technical Table

WBS/CRS Number	WBS/CRS Element	Parameter Name	Value	Unit of Measure	Unit Qualifier	Estimate or Actual	Source	Notes
1.0	Aircraft							
1.1	Air Vehicle							
		Crew Size		Quantity				
		Number Of Engines		Quantity				
		Engine Type		List				
		Length		Feet				

Software Development Table

WBS/CRS Number		1.x.y.1		Release 1				
WBS/CRS Element		WBS/CRS Name		CSCI 1		CSCI n		
Parameter Name	Unit of Measure	Unit Qualifier	Value	Value	Estimated or Actual	Value	Estimated or Actual	
Release Level Context								
Release Begin Date	Date							
Release End Date								
CSCI Level Context								
CSCI Start Date								
CSCI End Date								
Total Software Requirements								
Total External Interface Requirements								
Software Size								
Sizing (SLOC Based)								
Software Language								
Human Generated	SLOC							

Nonhardware Technical Table

WBS/CRS Number	WBS/CRS Element	Parameter Name	Value	Unit of Measure	Unit Qualifier	Estimate or Actual	Source	Notes
1.2	System Engineering							
		Number of Platforms - Integrated		Quantity	Platforms			
		Number of Interfaces Integrated		Quantity	Interfaces			
		"Share						
		Document Name		Text				
		Provide Quantitative Staffing Data:						
		System Engineering Effort		Hours				
		Staffing - Level		FTE				
		Staffing - Profile		List				
		FTE Factor		Hours				

O&S Table

WBS/CRS Number	WBS Element	Parameter Name	Value	Unit of Measure	Unit Qualifier	Estimate or Actual	Source	Notes
1.0	Sustainment Effort / General							
		System Life		Years, Hours, Miles				
		Storage						
		Annual						
		Fleet						
1.2.1.1	Energy							
		For						
		Energy Consumption Rate		Gallons, Barrels or Kilowatts				
		Energy Consumption		Gallons, Barrels or Kilowatts				
1.2.1.2	Training Munitions/Expendable Stores							
		For each munition type expended 1…n						
		Number of Training - Weapon Items Expended		Quantity	by Munition Type			

Describing Your PMP in Tables
Hardware

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■ **The PMP Technical Table is a list of cost drivers organized by WBS**

> Enter the parameter's value

> Cite pedigree

WBS/CRS Number	WBS/CRS Element	Parameter Name	Value	Unit of Measure	Unit Qualifer	Estimate or Actual	Source	Notes
1.0	Aircraft							
1.1	Air Vehicle							
		Crew Size		Quantity				
		Number Of Engines		Quantity				
		Number Of Main Rotors		Quantity				
		Number Of Passengers		Quantity				
		Number Of Tail Rotor Blades		Quantity				
		Engine Type		List				
		Length		Feet				
		Weight - Maximum Takeoff		Pounds				
		Weight - Maximum Landing		Pounds				
		Weight - Wet		Pounds				
		Weight - Dry		Pounds				
		Speed - Maximum		Knots				
		Range - Maximum		Nautical Miles				
1.1.1	Airframe							
		Material Mix 1…n		Percent	Weight by Material Name			
		Weight		Pounds				
		Technology Readiness Level (TRL)		List				
		Manufacturing Readiness Level (MRL)		List				

> Cite specific source for value (e.g. SME name and organization or a specific reference document)

> Use Notes column to add any text necessary to amplify anything on this row

Describing Your PMP in Tables
Software

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Enter Software WBS/Release

Enter CSCI/WBS

WBS/CRS Number	1.x.y.1		Release 1						Release n
WBS/CRS Element	WBS/CRS Name			CSCI 1		CSCI n			
Parameter Name	Unit of Measure	Unit Qualifier	Value	Value	Estimated or Actual	Value	Estimated or Actual		Value
Release Level Context									
Release Begin Date	Date								
Release End Date	Date								
CSCI Level Context									
CSCI Start Date	Date								
CSCI End Date	Date								
Total Software Requirements									
Total External Interface Requirements									
Software Size									
Sizing (SLOC Based)									
Software Language									
Human Generated	SLOC								
Auto Generated	SLOC								
Reuse from External Sources With Modification	SLOC								
Reuse from External Sources Without Modification	SLOC								
Carryover Code With Modification	SLOC								
Carryover Code Without Modification	SLOC								
Government Furnished Code With Modification	SLOC								
Government Furnished Code Without Modification	SLOC								
Deleted Code	SLOC								
Sizing (RICE-FW Object Based)									
Reports	Reports	Low, Medium, High, or Total							
Interfaces	Interfaces	Low, Medium, High, or Total							
Conversions	Conversions	Low, Medium, High, or Total							
Extensions	Extensions	Low, Medium, High, or Total							
Forms	Forms	Low, Medium, High, or Total							
Workflows	Workflows	Low, Medium, High, or Total							
Sizing (Other Basis)									
For each Other Measure 1…n									
Other Measure 1									
Other Measures Name	Description								
Other Measures Count	Quantity								
Other Measures Standards	Description								
Product Description									

Enter Software WBS/Release Parameter Values

Enter CSCI Parameter Values

Repeat CSCI 1…n

Repeat Release 1…n

Cite pedigree

Describing Your PMP in Tables
Software without the Software Dev Table

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- **Typically only for Small Software Projects**
  - **Separate software cost reporting not expected**
  - **Software size is one of many non-recurring parameters**
- **Also could be used for pre-MS B CARDs**
  - **Though as program matures and software is on contract, migrate to use of the Software Table**

WBS/CRS Number	WBS/CRS Element	Parameter Name	Value	Unit of Measure	Unit Qualifier	Estimate or Actual	Source	Notes
1.1.4	Guidance							
…	…							
1.1.4.4		Guidance Software Release 1...n (Specify)						
1.1.4.4.1		Guidance Software Release 1…n CSCI 1…n (Specify)						
		Software Language		Text				
		Product Size - Delivered		SLOC				
		Product Size - Effective		SLOC				
		ESLOC Equation		Text				
		New Code		SLOC				
		Modified Code		SLOC				
		Reused Code		SLOC				
		Carryover Code		SLOC				
		Auto-generated code		SLOC				

Enter parameter values

Quantity Described in Tables

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WBS Number	WBS Element
1.0	Aircraft
1.1	Air Vehicle
1.1.1	Airframe
1.1.1.1	Airframe IAT&Co
1.1.1.2	Fuselage
1.1.1.3	Wing
1.1.1.4	Empennage
1.1.1.5	Nacelle
1.1.1.6	Other Airframe Components (specify)
1.1.2	Engine/Propulsion
1.1.2.1	Propulsion IAT&Co
1.1.2.2	Propulsion Hardware
1.1.2.3	Propulsion Software Release 1..n (Specify)
1.1.2.3.1	Propulsion Software CSCI 1..n (Specify)

WBS Number	WBS Element
1.2	System Engineering
1.2.1	Software Systems Engineering
1.2.2	Integrated Logistics Support
1.2.3	Other Systems Engineering 1...n (Specify)
1.3	Program Management
1.3.1	Software Program Management
1.3.2	Integrated Logistics Support
1.3.3	Other Program Management 1...n (Specify)
1.4	System Test and Evaluation

WBS Number	WBS Element
1.0	Sustainment Effort
1.1	Unit-Level Manpower
1.1.1	Operations Manpower
1.1.2	Unit-Level Maintenance Manpower
1.1.3	Other Unit-Level Manpower
1.2	Unit Operations
1.2.1	Operating Material
1.2.1.1	Energy (Fuel, POL and Electricity)

Quantities Time-phased Table

Item Name	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR n ...	Long Lead Requirements	Unit of Measure	Unit Qualifier
Designate each column as Estimate or Actual														
Quantity - Procurement														
End Item #1														
End Item #2														
End Item #3														
End Item #4														

Configured end-item quantity by year (parent level)

Configuration Table

WBS Number	WBS Element	Lower-level Assembly or Part	Configuration Type 1 (Specify)	Configuration Type 2 (Specify)

Child level quantity per end-item

Manpower Time-phased Table

Item Name	Constant Per System Value	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR n ...	Unit of Measure
Designate each column as Estimate or Actual --->													
Acquisition													
System Program Office													
System Program Office													
Other Government Agency													
Operating and Support													
Organization/Command/Location 1…n (Specify)													

Full Time Equivalents in Acquisition (typically for Government PM office staff)

Operational manpower for O&S

Quantities and O&S Table
General Instructions

List all program years.
Avoid using Prior and To-complete columns - be explicit

Designate each column as estimate or actual

Item Name	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR n …		Long Lead Requirements	Unit of Measure	Unit Qualifier
Designate each column as Estimate or Actual --->															
Quantity - Procurement															
End Item #1															
End Item #2															
End Item #3															
End Item #4															
…															
Training Item #1															
Training Item #2															
…															
Support Equipment Item #1															
Support Equipment Item #2															
…															

Enter annual quantity

Enter text describing long-lead requirements or any else pertinent to resource spreading

Tailor rows to reflect program's PMP End Items, Training Items, and Support Equipment

Cite quantity units as aircraft, missiles, systems, installations, pods, kits, etc

- **Use table to lay out annual quantity of not only PMP End Items but anything usefully described as a series of annual values, e.g., Training and Support Equipment as shown (Note Manpower has its own table)**

Configuration Table
General Instruction

CARD Tables
Configuration Table

Name columns for each configuration. Insert columns as needed.

WBS Number	WBS Element	Lower-level Assembly or Part	Configuration Type 1 (Specify)	Configuration Type 2 (Specify)	Configuration Type 3 (Specify)	Configuration Type 4...n (Specify)

Enter WBS Number

Enter WBS Element

If necessary to fully convey the configured items, use this column for assembly/part designation or part number.

Enter quantity per assembly.

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Configuration Table

WBS Element	Production Representative AUR	Instrumented Round less Warhead	Captive Carry Sensor Suite	AGM-nnn Model C	AGM-nnn Model D
Missile System					
Air Vehicle					
Airframe					
Airframe Common to all Models	1	1		1	1
Airframe Unique to Model C	1	1		1	
Airframe Unique to Model D					1
Propulsion	1	1		1	1
Power and Distribution	1	1		1	1
Guidance	1	1	1	1	1
Navigation	1	1	1	1	1
Controls	1	1		1	1
Communications	1	1	1	1	1
Payload	1			1	1
On Board Test Equipment		1			

Acquisition Quantities Time-Phased Table

Item Name	2017	2018	2019	2020	2021	2022
Quantity - Prototype						
Production Representative AUR		120				
Instrumented Roundless Warhead	20					
Captive CarrySensor Suite	5					
Quantity - Procurement						
AGM-nnn Model C				90	500	500
AGM-nnn Model D						50

- The columns on the Configuration Table should match the rows on the time-phased Quantity Table. (Think: matrix math will provide the total quantity by child element.)

Configuration Table

WBS Element	AGM-nnn Model C	AGM-nnn Model D
Missile System		
Air Vehicle		
Airframe		
Airframe Common to all Models	1	1
Airframe Unique to Model C	1	
Airframe Unique to Model D		1
Propulsion	1	1
Power and Distribution	1	1
Guidance	1	1
Navigation	1	1
Controls	1	1
Communications	1	1
Payload	1	1
On Board Test Equipment		

PMP Hardware Technical Table

WBS/CRS Element	Parameter Name	Value	Unit of Measure	Unit Qualifier
Missile System				
Air Vehicle				
Airframe				
Airframe Common to all Models				
	Weight		Pounds	Total
	Material Mix 1…n		Percent Weight	Material Name
Airframe Unique to Model C				
	Weight		Pounds	Total
	Material Mix 1…n		Percent Weight	Material Name
	Wing Chord		Inches	
	Oswald Efficiency Factor		Dimensionless	
	Zero Lift Drag Coefficient		Dimensionless	
	Number of Surfaces - Movable		Quantity	Surfaces
Airframe Unique to Model D				
	Weight		Pounds	Total
	Material Mix 1…n		Percent Weight	Material Name
	Wing Chord		Inches	
	Oswald Efficiency Factor		Dimensionless	
	Zero Lift Drag Coefficient		Dimensionless	
	Number of Surfaces - Movable		Quantity	Surfaces

- **Think ahead also to the WBS and how the cost, quantity, and technical data will tie together**

Manpower Time-Phased Table
General Instructions

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> List all program years.
> Avoid using Prior and To-complete columns - be explicit

> Designate each column as estimate or actual

Item Name	Constant Per System Value	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR n ...	Unit of Measure
Designate each column as Estimate or Actual --->													
Acquisition													
System Program Office (Summary Breakout)													
System Program Office (Expanded Functional Breakout)													
Other Government Agencies													
Operating and Support													
Organization/Command/Location 1…n (Specify)													
Operate													
Maintain													
Support													
Train													
Sustaining/Systems Engineering													
Program Management													

> Enter annual quantity

> If applicable, express on a per system or per organization basis. Use Note column to further describe

> Recommend use Full Time Equivalents (FTE). Use Notes column to elaborate on FTE definition

> Tailor rows to reflect organizations and functional breakouts for the program (Major categories shown here – breakouts on next chart)

- **Use table to lay out annual headcount**
  - **Acquisition Phase**
  - **O&S Phase**
  - **Table rows for prime contractor staff not provided, but could be added if needed**

Detail Described in Tables

- **When program matters to the point when an understanding of removables is complete, describe each on the LRU Table**

WBS Number	WBS Element	WUC Number	WUC Element	LRU/Part - Number	LRU/Part - Name	Vendor Name	MTBF - Inherent	MTBF - Induced	MTBF - Combined	MTBF Basis	Condemnation Rate	Level of Repair (O, I, or D)	Owning Organization

LRU Table

- **For COTS-heavy programs or selected COTS-heavy WBS elements provide BOM via the Parts Table**

WBS/CRS Number	WBS/CRS Element	Part Number	Vendor Name	Description	Developed/NDI/ COTS/GOTS	Quantity	Unit of Measure	Warranty Period	Warranty Period Unit of Measure

Parts Table

- **Describe GFE on the GFE Table**

WBS/CRS Number	WBS/CRS Element	Part Number	Vendor Name	Part Name/ Description	Developed/NDI/ COTS/GOTS	Quantity	Unit of Measure	Warranty Period	Warranty Period Unit of Measure	Source	Notes

GFE Table

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LRU Level Table

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> Removable Unit Name or Number is primary row identifier

> Estimated or actual hours or miles between failures

> Percentage of time that a repairable item can not be repaired and will have to be replaced

WBS Number	WBS Element	WUC Number	WUC Element	LRU/Part - Number	LRU/Part - Name	Vendor Name	MTBF - Inherent	MTBF - Induced	MTBF - Combined	MTBF Basis	Condemnation Rate	Level of Repair (O, I, or D)	Owning Organization

> Four columns to the left are available to tag each LRU to WBS or WUC as may be useful

> Specify MTBF unit of measure (e.g. hours or miles)

> If a LORA has taken place, enter the associated maintenance level (Organizational, Intermediate or Depot) conducting the repair. Else omit.

- **Describe removables such as LRUs on this table**

> Source and Notes Columns to the right (not shown)

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Part Level Table

Part Number is primary row identifier

Two columns to the left are available to tag each part to WBS as may be useful

WBS/CRS Number	WBS/CRS Element	Part Number	Vendor Name	Description	Developed/NDI/ COTS/GOTS	Quantity	Unit of Measure	Warranty Period	Warranty Period Unit of Measure

Nonrecurring Price	Unit Price	Price Total	Warranty Price	Warranty Unit Price	Estimate or Negotiated	Competitively Sourced (Y/N)	Contract Type	SBIR (Y/N)	Stepladder Low Quantity	Stepladder High Quantity	Stepladder Price

If a priced bill of materials is provided, enter values for these columns.

If tiered (stepladder) pricing is available, repeat this three-column set as needed to convey completely.

- **Priced BOM as needed. Also any part list, e.g.:**
  - **High-dollar items**
  - **Anything with a known tiered pricing schedule**

Source and Notes Columns to the right (not shown)

GFE Table

> Part Number is primary row identifier …

> ... or Part Name

> Two columns to the left are available to tag each item to WBS as may be useful

WBS/CRS Number	WBS/CRS Element	Part Number	Vendor Name	Part Name/ Description	Developed/NDI/ COTS/GOTS	Quantity	Unit of Measure	Warranty Period	Warranty Period Unit of Measure	Source	Notes

- **Simply list GFE**

- **If GFE comes with a warranty, provide that information as well.**

O&S Table
General Instructions

WBS/CRS Number	WBS/CRS Element	Parameter Name	Value	Unit of Measure	Estimate or Actual	Source	Notes

Organized by WBS

The parameter's name, value, and units

Cite reference document as applicable

Cite reference document as applicable

Use Notes column to add any text necessary to amplify anything on this row.

- **Similar to Hardware PMP Technical Table: fixed columns with rows of parameters organized by WBS**

- **While the Acquisition and Manpower Tables had some time-phased O&S information, this table is for remaining static or steady-state parameters**

- **Tailor rows as needed to convey pertinent sustainment cost drivers for your system**

- **Typically only a single O&S Table is needed**

Program Overview in Tables

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- **Additional Tables used to provide essential program context**

Program Table

Milestones Table

Acquisition Table

Roles Table

Budget Plan Table

WBS/CRS Definitions Table

Program Table
General Instructions

Enter values

Parameter Name	Value	Definition of Parameter	VocabularyID
Program Name		Defense Cost and Resource Center (DCARC) defined Program Name	DCARCMetadata
Name - Short		DCARC defined, acronym	CEMVocab
Name - Popular		An optional alternative name	CEMVocab
Program Description		DCARC defined program description	CEMVocab
Program Number		Program Number from Defense Acquisition Management Information Retrieval (DAMIR)	DCARCMetadata
Mil-Handbook		Mil-STD-881 Appendix	DCARCMetadata
Weapon System Type		DCARC defined	DCARCMetadata
Lead Service		DCARC defined Service/Component	DCARCMetadata
Other Services		If a program is "Joint", then list other services involved in the program.	DCARCMetadata
Procuring Organization		SysCom	DCARCMetadata
Program Office		Program Executive Office (PEO) or Program Office	DCARCMetadata
Initial Selected Acquisition Report (SAR)		Date from Defense Acquisition Management Information Retrieval (DAMIR)	DCARCMetadata
Latest Selected Acquisition Review (SAR)		Date from DAMIR	DCARCMetadata
Upgrade/Modernization		Yes/No category	CEMVocab
Subprogram Name		Subprogram name if applicable	CEMVocab
Model		Specific configuration or designated model number	CEMVocab

Unlikely to need to tailor except perhaps insert additional rows for Subprogram and Model.

- **Program Table is a single sheet**

- **Typically no need to have multiple sheets**

- **Expand Subprogram and Model rows as needed**

Milestone Table
General Instructions

Enter values as month, date, and year

Cite source of value IMS, TEMP, etc.

Parameter Name	Subprogram	Value	Estimate or Actual	Source	Notes
Material Development Decision					
Completion of Analysis of Alternatives (AoA) or Equivalent					
Alternative Systems Review (ASR)					
Milestone A					
Technology Development & Risk Reduction Contract Award					
Capability Development Document-Validation (CDD-V)					
System Requirements Review (SRR)					
System Functional Review (SFR)					
Development RFP Release Decision Point					
Preliminary Design Review (PDR)					
Milestone					
EMD Co					
Critical D					
Risk Reduction Build					
Development Test & Evaluation Begin					
Delivery of First EMD Unit/First Build					

Tailor as required to add rows, hide rows, capture subprogram

Show by subprogram if needed

Designate each Date as Estimated or Actual

	Phase Level Description	Contractor Name; Agency Name	Contract Number; Subcontract Number; MIPR Number	Award Date; Begin Date	End Date	Option Number	Contract Fee
Material Solution Analysis							
Enter Phase Level Context:							
Contracting Strategy							
Competition Approach							
Withhold Rate							
Additional Information							
Enter Contract Level Context:							
Contract 1…n (Specify)							
Subcontract 1…n (Specify)							
Enter Each Government Agency Context:							
Program Office Support 1…n (Specify)							
Test Agency 1…n (Specify)							
Other Government Agency MIPR 1…n (Specify)							

Describe characteristics of each contract within each phase

Specify each contract and agency participant in this column. Copy and insert/paste rows as needed.

Describe characteristics of each agency participant within each phase

- **Criteria for listing subcontracts varies. Consider:**
  - **Level of anticipated estimating methods, contract loading, time-phasing, etc.**
  - **CSDR reporting thresholds: Over $50M (Optional between $20M and $50M)**

Roles Table
General Instruction

Provide Name of Key Subcontractor/Supplier/Third Party etc

WBS/CRS Number	WBS/CRS Element	Government Role	Prime Contractor	Secondary Subcontractor/Supplier/Third Party	Tertiary Subcontractor/Supplier/Third Party	Notes

Enter WBS Number

Enter WBS Element

Designate if each WBS element is Government or Prime Contractor responsibility with contractor name or Govt agency

Enter additional clarifying text as needed e.g. contracting relationship

Budget Plan Table
General Instructions

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Enter Fiscal Years.
Avoid Prior and To-Complete.
Insert columns as needed

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CARD Tables
Budget Plan CARD Table

Enter annual costs (planned budget)

List all program years. Avoid using Prior and To-complete columns - be explicit.

Item Name	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR n ...
Air Force 3600											
0603800F											
Prime Contractor(s) Hardware and Software											
Advisory and Assistance Services (A&AS)											
Program Management Administration											
Direct Mission Support											
Federally Funded Research and Development C... (FFRDC)											
Program Management Administration											
Direct Mission Support											
Other Non-PMP Contractors											
Program Management Administration											
Direct Mission Support											
Other Government Costs											

Unit of Measure	Source	Notes
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		
Thousands of TY Dollars		

Enter each Appropriation in bold.

Enter each PE Code and indent underneath each appropriation.

Enter category breakout and indent underneath PE Code.

(Use Excel's Indent function - do not enter leading spaces in the cell)

Enter values

Enter each Appropriation and PE Code.
Add categories as underneath each.
Insert rows as needed

Cite source.
POM, PB, etc

WBS/CRS Definitions Table
General Instructions

- **Enter complete program Work Breakdown Structure and Dictionary**

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CARD Tables
WBS/CRS DEFINTIONS

WBS Number	WBS Element	WBS Defintion
Enter WBS Number		Enter WBS Definition
	Enter WBS Name	

Repeating Tables in a CARD Workbook

- **Tables (workbook sheets) may be replicated as needed to describe the program or simply for convenient organization**
  - **The PMP Technical can be split into WBS segments**

    | PMP Technical-Aircraft | PMP Technical-Engine | PMP Technical-Avionics |

    - **Or separate models**

      | PMP Technical-AGM-999A | PMP Technical-AGM-999B |

  - **The Nonhardware Technical can be slit by phase (or contract, or lot)**

    | Nonhardware-TMRR | Nonhardware-EMD | Nonhardware-LRIP |

  - **The Software Development Table must be repeated for each WBS element**

    | Software Dev-Avionics | Software Dev-Weapons | Software Dev-Training |

Closing Slide

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■ **For additional details, contact …**

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